

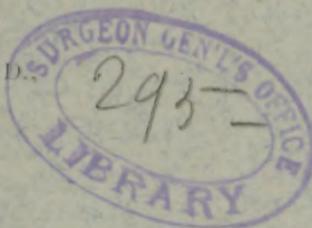
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Galvano-Cautery

IN

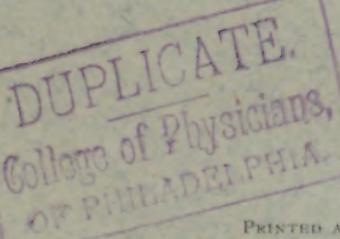
Diseases of the Prostate,
Bladder and Urethra.

BY
ROBERT NEWMAN, M.D.,
OF NEW YORK.



Read in the Surgical Section, at the Thirty-Seventh Annual
Meeting of the American Medical Association.

*Reprinted from the Journal of the American Medical
Association, August 28, 1886.*



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GALVANO-CAUTERY IN DISEASES OF THE PROSTATE, BLADDER AND URETHRA.

Hypertrophy of the prostate gland is a disease from which most old men suffer. The gradual advance of the malady and its unavoidable complications, such as spasms of the bladder, retention by mechanical obstruction, cystitis, dilatation of the ureters, pyonephrosis and uræmia, make life a burden. A large majority of these sufferers succumb prematurely.

No rational treatment has thus far been adopted for the cure of this disease. Volumes have been written on the subject. Various methods have been suggested for the amelioration of the trouble and allaying of actual pain. A few cases have been reported as cured, either by injections, destruction, incision, enucleation, prostatotomy, etc., but no successful method of cure has been determined. Radical cures by surgery have been very few, most patients having died shortly after the operation. The great importance of establishing a method for the *radical* cure of the enlarged prostate no one can gainsay.

For the last five years I have endeavored to apply galvano-cautery directly to the hypertrophied prostate, but was unable to, from lack of a suitable instrument. Mechanics when consulted shook their heads, failed to construct the desired instrument or carry out my plans, and some declared it impossible to make my ideal instrument.

True, many difficulties had to be overcome. A smooth sound was needed of small size, easy of introduction to the spot to be cauterized. Both insulated poles had to be placed in the interior of this

instrument, and the mechanism so arranged that the platinum could be heated to the desired degree instantaneously, with certainty and beyond possibility of failure. The cautery, its beginning, duration and ending, as well as the quantity used, must be under the absolute control of the operator. The platinum burner must not, in its entire length, touch anything, the heat must be concentrated, and not approach the surrounding parts of the instrument; the connections must be perfect and act promptly. The instrument must be light, small, handy, have the correct curve, and so arranged that the operator can manage the entire procedure without an assistant. The entire mechanism must be placed within the limited space of a No. 18 French scale sized tube. Next we must have a battery, so constructed as to give a certain quantity of electricity of a fixed potential, suited to the work to be done and the instrument; too high a potential will melt the platinum wires or cut the tissues like a razor; on the other hand, too low a potential will fail to heat the wire or not be effective. Therefore it is imperative to measure the electricity necessary for our work and instrument; for the same quantity of electricity under the same circumstances will always do the same work.

To fulfil these requirements in the construction of the instrument, was a difficulty which was overcome only by six months' constant hard work, trials, vexations, experiments, drawings and models, by myself and Dr. L. Drescher, to whose skill and labor I am largely indebted for the perfection of my idea. I am much pleased to exhibit and demonstrate here the result—*the galvano-cautery sound*.

The instrument is in the shape of a catheter, of smooth, polished metal, with a short curve. At the end of its convexity is a fenestrum, in which is placed a platinum wire to be heated. This wire may be shaped differently, either straight, curved or serpentine, in order to get more or less surface cautery.

The other end of the instrument is straight and forms the handle; from this end emerge two wires, the heat conductors, each of which is connected by binding screws to electrode wires, which respectively go to the positive and negative pole of the battery. The current-breaker is attached to one pole at the handle.

Any good galvano-cautery battery may be used with the instrument, but it is necessary, as before stated, to so regulate the battery that it yields the exact electrical potential to be used for the operation. I use a Dawson battery, which works to my entire satisfaction. Experiments are necessary to establish the standard. The heat must be of a high red color, just short of white heat, the instant the current-breaker is touched; this heat must be kept while the wire is in contact with the mucous lining. Less electricity is required to heat a free wire in dry air than to heat a wire held against a moist surface. The strength of the fluid is adjusted according to these requirements; the elements are immersed in the fluid to a certain depth, the electrode wires are regulated with regard to their size, length, etc.

Having determined these requirements for the operation, there will be no further trouble. It is a certainty that, in the near future, every scientific instrument-maker will construct his apparatus with the graduated measure needed, attached and regulated, so that the operator can use any measure desired. We can also use the storage-battery, consisting of a series of cells, which answers our purpose as well as for electrical illumination. This battery, once adjusted with reference to the quantity needed, works with equal power and steadiness till the stored electricity is exhausted. The last of its electricity has the same effect as the first. This instrument, though portable, is rather heavy. We may use the dynamo machine, which can be operated by hand, foot, hydraulic pressure or steam according to construction and desire. Such machine I have seen here in St.

Louis at the store of Mr. A. S. Aloe (cor. 4th and Olive streets).

I repeat, no matter what kind of a machine is used, a fixed measure of electricity is necessary. You will see its action in some of the experiments; beginning with one flash of light, to be followed by several quick flashes. You have observed that the flash is simultaneous with the connection, which is important and absolutely necessary. If the wire is heated slowly, becoming warm and gradually hotter, till the desired heat is obtained, it shows that the instrument is faulty in its construction, consequently must be imperfect in its action. In experimenting with the instrument on mucous linings, we find that a galvano-caustic application of the same power acts differently according to the length of time of contact with the tissues. Thus the effects can be regulated from a light blush to the total destruction, or even amputation of the tissues.

It is a mistaken idea of many, that the galvano-cautery necessarily burns, destroys, and is followed by cicatricial tissue. Nevertheless, this is a favorite objection of some ignorant persons and enemies of electricity. If the operator bungles, or wishes to destroy, he can, but the expert will not. It is well known that eminent neurologists apply galvano caustic directly to the faces of young ladies, without ever causing marks. All depends on the manner of application. Even deeper applications on mucous linings may cauterize without destroying. Voltolini, Carl Michel, Shurly and Yemans, of Detroit, and many others, have applied the cautery to the nasal and pharyngeal cavities with great success. Therefore it is evident that different methods can be instituted with the instrument, and applied for various purposes to different parts.

We will now consider the application to the "enlarged prostate." Patients suffer more or less from this disease; they may be perambulant or in bed, or

divide their time between bed and room; the hypertrophy may be small or extend to the size of an egg, or even an orange. Complications and pain may add beyond endurance to the sufferings. According to the state and circumstances the treatment must be selected, and the method applied. As some cases are beyond cure, the prognosis must be given cautiously, and according to the state of the patient.

The treatment which I prefer, and am now practicing, and alone recommend, and which has done good service, is the *slow (regular) method*. This means, give the enlarged gland a short application, from a moment to three seconds' duration; this causes not more than a white film similar to the effect of nitrate of silver, in the treatment of Desormeaux. The *modus operandi* is as follows: The instrument is connected with the electrode wires, which are then attached to the battery. The fluid in the cells must be of the right standard, and all the machinery in perfect order. When all is ready, I invariably let the cells down and try the instrument with a short flash. No matter what assurance I have of the perfection of the appliances, this little experiment excludes any possible failure. The prostatic portion to which the cautery is to be applied must have been ascertained, and the distance from the meatus measured. This distance is then marked on the instrument by a small rubber band. The patient, according to his preference, may stand erect, be on an operating table or in bed. The instrument is then introduced so that the fenestrum with its platinum wire is in contact with the part to be cauterized. The operator will know by touch when the instrument is in the right place, and the measure will corroborate the correctness of the situation. One hand holds the instrument and the other sets the battery in motion, and then touches the little spring to connect the interruptor, a flash follows, the finger disconnects the current. In one moment the operation is done, and

the instrument is withdrawn. It causes no pain, and in some instances the patient scarcely believes that anything has been done. He is able to walk about and is not detained from business. In cases of very irritable patients, I have used cocaine injections, but it was scarcely necessary. The séance should be repeated in about three days, or even in two. The instrument must be kept scrupulously clean, as the cautery will fail, if there is dirt between the connections.

The question now arises, how does this method bring about a cure? The end sought is, first to remove the obstruction, so that the bladder can discharge all the urine, and at regular intervals; and then, in order to make the cure radical, to reduce the prostate to its normal size. The theory is that the cautery first acts as a tonic and next as an astringent; the mucous lining shrivels up, the glandular tissue contracts, and by shrinkage the size is diminished. The stimulation gives new life and healthy action. Each repetition of the operation acts similarly, and perhaps on another part of the hypertrophy. The operation must be continued till the cure is effected. Care must be taken not to over-stimulate, and cause prostatorrhœa, prostatitis, etc., thereby creating or aggravating the very ailment we seek to cure. The cautery must be given just severely enough to accomplish the object and no more. If the cauterization is too prolonged, and too deep, the glandular action is overtaxed and weakened and will be followed by a terrible prostatorrhœa, which takes a long time to cure. At the same time an inflammation is created, which causes pain and swelling, and at last, the too greatly cauterized tissue will slough away and may cause septicæmia.

For these reasons, I prefer the slow method described, and am opposed to rapid methods, or too deep cauterizations.

The practical workings I judge by analogy, from

observations of the cautery in hypertrophied tonsils. Great similarity of anatomical structure exists between the tonsils and the prostatic gland—both are glandular organs, covered by mucous lining, having epithelium; both are secretory organs, having ducts, follicles, canals, and one twelve to fifteen orifices and the other twelve to twenty small excretory ducts. In hypertrophy of the tonsils, after other remedies had failed, I succeeded by using galvano-cautery with this same instrument. The application was made in cases of children of very tender age, who stood free before me, and without any aid or force opened the mouth, and went through the operation without flinching. Not one complained of pain, all came back to have the cautery repeated, and then stood still with more confidence than at first. In these cases the immediate effect was a splendid illumination of the whole buccal cavity, and a white film was seen on the tonsil after withdrawing the instrument. The cautery could be repeated in two or three days; in one case it was done the next day. Sometimes the cautery was repeated in the same place, at other times, from preference, an adjoining place on the tonsils was selected. Almost daily observations of this series of cases convinced me that the galvano-cautery acted practically just as I have theoretically described. The patients were benefited, the tonsils diminished in size, and a cure effected. It was remarkable how soon the mucous lining regained its normal color, and when a deeper cauterization was used, there was no unpleasant slough, only a patch was observable, like in appearance to follicular tonsillitis. The instrument was well adapted for the tonsils, the curve suited exactly, the fenestrum could be held against the exact place to be cauterized, without possibility of burning any other part by accident.

In treatment of the enlarged prostate by galvano-cautery, it is absolutely necessary to pay attention to other symptoms and troubles of the patient, accord-

ing to established principles. Pain must at all hazards be allayed; this I generally accomplish by rectal suppositories. Chas. Mitchell, of Philadelphia, prepared for me some gelatine articles which act very well. In medication I rely mostly on belladonna. The bowels must be kept regular, since constipation adds considerably to the inflammation, and by pressure causes pain. While the galvano cautery is used, it is of the greatest importance to attend to the state of the bladder by drawing off the urine and washing the bladder out.

Another possible method, which I call the *rapid*, consists in the destruction of the obstructive part of the prostate in one séance. This is done by holding the cautery on the offending part till the cautery has burned it down and made room for the passage of the urine. The objections to this method are the immediate shock, followed by pain and inflammation, which generally cause a new obstruction, partly by spasm of the bladder and partly by the débris of the destroyed gland. There is even danger of septicæmia. At best the patient is kept in bed, in pain and anxiety, for a long time. Prof. Bottini, of Pavia, practised a similar operation with ultimate success. He constructed his own instrument, and kept up the cautery forty-five seconds. The patient was kept in bed afterwards, and on the twenty-fourth day for the first time passed water voluntarily. It took six months before he was cured. While I admire the zeal of Bottini, I scarcely think his method will become popular.

Another method is the *radical*. It consists of perineal section, and at the same time the total destruction of the hypertrophied part of the prostate by galvano-cautery. This can be done with my instrument, either per urethram, per perineum, or by a larger galvano-cautery burner, or by the galvano-sling. The after-treatment consists in diligently washing out the bladder, using disinfect-

ants, and keeping a catheter in the perineal wound. I would not hesitate to perform this latter operation, if indicated; that is, if the patient had no other chance, if it would be a risk to wait for any other procedure, and particularly if the case is complicated with strictures and consequently too violent spasms of the bladder.

A few days ago a man came under my observation, in whose case this operation would have been the only rational procedure. He had several strictures, admitting no larger sound than a No. 11 French scale, he had a calculus in the bladder, a perineal fistula, and hypertrophy of the prostate; was weak, in pain, and run down constitutionally. With such complications perineal section is the only known rational operation; in fact, no other would fulfil the indications.

Galvano-cautery has advantages over the knife, it avoids haemorrhage and leaves no raw surface to heal. The cautery protects the amputated surface with a scab, under which the healing process takes place.

Other Uses of the Instrument.—Though my instrument was constructed for the prostate, it has done good service in other diseases, which I will briefly mention.

Spermatorrhœa.—This disease is rare, but one genuine case was treated by applying the cautery to the ejaculatory ducts at 6 $\frac{1}{2}$ inches from the meatus. The applications were repeated once a week.

Impotence.—In several cases the galvano-cautery was applied to different places, such as prostate, Cowper's glands and ejaculatory ducts. The treatment was aided by other means.

In diseases of the bladder the instrument has worked admirably, particularly in villous tumor with haematuria, and in traumatic ulcer of the neck of the bladder. The patient had been injured, and a ragged wound near the neck of the bladder was transformed into a chronic ulcer. The place could be felt by the

introduction of the instrument, the patient himself could give the best information when any instrument came in contact with the ulcer. One patient, weakened by years of constant haematuria, passed no bloody urine after the first application of the cautery.

Urethral granulations, denuded surfaces, and ulcers readily yield to the galvano caustic treatment. Frequently patients present themselves to be treated for a chronic discharge, some call it leakage. I consider it error to assert that all chronic discharges of the urethra spring from strictures. On the contrary, I often find that when strictures are radically cured, the old troublesome discharge remains.

For twenty years I have treated such cases by local application through the endoscope. Generally we find chronic granulations, which yield to local, circumscribed applications of nitrate of silver, repeated at intervals. Sometimes we find denuded surfaces, which bleed at touch, sometimes chronic congestions, and even ulcers. With these affections the galvano-caustic has done better and cured quicker than the old method. The endoscope is needed to diagnosticate and locate the diseased spot.

Dr. Louis Sass treats *urethral strictures* by galvano-caustic, with an instrument he himself constructed.

I reiterate, my instrument was designed expressly for treatment of the enlarged prostate. I have used it since October, 1885. During those six months of use it fulfilled its purpose, and was useful in a variety of other diseases as stated. Detailed clinical histories of cases are not now given, for many reasons. Six months' work with a new instrument does not warrant in alleging an established method, or in giving reliable statistics or forming undeniable conclusions.

While the instrument has so far given me satisfactory results, yet more time is needed for observation, in order to give accurate statements and form fixed opinions. The time here allotted for reading a paper

excludes a more extended statement. I hope that in the future I shall be able to complete the statistics of **my new method.**

The sole object of this paper is to introduce and explain to the profession my new instrument, and to establish my method of treatment of hypertrophy of the prostate.

68 W. 35th St., New York, May, 1886.

